

Dynamic Links between the Economy and Human Development

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I. Introduction¹

HD is increasingly viewed as the ultimate objective of development in place of economic growth. Yet the links between HD and EG remain of critical importance since EG would appear to be a foremost contributor to sustained progress in HD. Moreover, not only are improvements in HD the fundamental development goal, but HD is itself an important contributor to EG over time. Hence it is important to explore the two way links between HD and EG. The aim of this paper is to examine these relationships and to draw policy implications from the analysis.

HD has been defined as 'a process of enlarging people's choices' (UNDP's first Human development Report, 1990, p 10). This definition is, of course, very broad, including non-material aspects such as the many dimensions of political, cultural and social freedoms. In this paper, however, we shall take a reductionist approach and focus exclusively on two important material aspects - people's health and their education.

Clearly, there exist strong connections between EG and HD. On the one hand, EG provides the resources to permit sustained improvements in HD. On the other, HD improvements raise the capacities of economic agents who make the critical contribution to EG. Each of these relationships has often been acknowledged separately - for example, the way EG affects HD forms part of the Basic Needs literature, while the impact of improved labour quality of economic growth has been widely explored in the human capital literature. Yet the two strands have seldom been put together within one dynamic analytical framework. It is important to understand the full implications of this two way linkage, both analytically and in actual country cases.

In this paper, we first identify the major links which make up the two chains between EG and HD (Section II). We then present some empirical cross-country evidence on these links (Section III). Section IV presents a typology of country cases, some representing the mutual reinforcement between HD and EG and some demonstrating asymmetric performance; this is followed by an investigation of the movement of countries from one situation to another over time. Finally, section V briefly reflects on the implications for policy.

¹ This paper draws heavily on previous work by the authors and others: see Ranis, Stewart and Ramirez, 2000; Ranis and Stewart, 2000; Boozer, Ranis, Stewart and Suri, 2003.

II. The Two Chains

We concentrate on two causal chains, one leading from EG to HD (Chain A), the other from HD to EG (Chain B). The two chains are pictured in Figure 1.

Chain A: From EG to HD

GNP contributes to HD through household and government activity, community organizations and NGOs. The same level of GNP can lead to very different performance on HD according to the allocation of GNP to these various groups and to distribution within each category.

Households' propensity to spend their income on items which contribute most directly to the promotion of HD, e.g. food, potable water, education and health, varies depending on the level and distribution of income across households, as well as on who controls the allocation of expenditure within households. In general, as the incomes of the poor rise, the proportion of income spent on HD items increases (Behrman 1993;1996). This means that higher and more equally distributed growth is likely to enhance HD expenditures. This is shown by much empirical evidence. For example, one estimate suggests that if the distribution of income in Brazil were as equal as Malaysia's, school enrollments among poor children would be 40% higher. There is also substantial evidence that greater female control over household expenditure increases the allocation to HD items. In the Côte d'Ivoire, for instance, an increase in women's share of household cash income was shown to be associated with significantly higher spending on food and reduced spending on alcohol and tobacco.²

Turning to the government – both central and local - the allocation of resources to improving HD is a function of total public sector expenditure, how much of this flows to the HD sectors, and the way in which it is allocated within these sectors. This can be expressed in the form of three ratios³: the public expenditure ratio, defined as the proportion of GNP spent by the various levels of government; the social allocation ratio,

2. Hoddinott and Haddad, 1991.

3. See *Human Development Report 1991*.

defined as the proportion of total government expenditure going to the HD-sectors; and, finally, the priority ratio, defined as the proportion of total HD-sector expenditure going to priorities within these sectors. To clarify, within HD-sectors, those expenditures which are clearly much more productive in terms of achieving advances in HD than others are defined as “priorities;” for example, basic education, especially at an early stage of development, is generally recognized to have a larger impact on HD than tertiary education. But the precise definition of what constitutes a priority area will inevitably vary according to a country's stage of development, rendering this third ratio more arbitrary than the other two. There exist very large variations across countries in each of these ratios, which means that the same level of GNP may be associated with very different levels of government spending on HD priorities.⁴ There is evidence that local government, *ceteris paribus*, tends to favour HD allocations relative to central government (see Klugman, 1994; Habibi et al., 2003; Ranis and Stewart, 1994),

The significance of public expenditure choices for improving HD is illustrated by a comparison between Kenya and Malawi. In the 1980s, a similar proportion of national income went to public expenditure (27% in Kenya; 30% in Malawi) but Kenya had a significantly higher social allocation ratio (47% compared to 35%) and priority ratio (34% compared to 14%) so that the proportion of GDP going directly to HD-improving priorities in Kenya was over three times that of Malawi (5.1% compared to 1.5%).⁵

Finally, NGO or other civil society activity is typically heavily oriented towards HD objectives (e.g. projects generating incomes for the poor and spending on schools, nutrition and health). Although in most contexts NGOs play a supplemental or even marginal role, in a few countries, e.g. BRAC in Bangladesh, and the 'Comedores Populares' in Peru, they appear to represent a major source of HD enhancement.⁶

4. See *Human Development Report 1991*, Chapter Three, and *Human Development Report 1996*, Chapter Three.

5. *Human Development Report 1996*, p. 71. These calculations adopt a narrow definition of social priority expenditure, including pre-primary and first level education plus primary health care only.

6. Riddell *et al.*, 1995.

A further important link in Chain A is the effectiveness of these expenditures in raising HD levels, which is represented here by the ‘Human Development Improvement Function’ (HDIF). An example of one important input into this production function is female education which abundant empirical evidence has shown to improve infant survival and nutrition.⁷ Other research, on Ghana, has demonstrated that, in rural areas, the provision of basic health services increases child health and survival significantly, while the evidence is less clear for urban services.⁸

It is evident from this discussion of the various links in the EG-HD chain that, in general, we expect important causal connections to exist between the economy and HD achievements, but that these connections are *not automatic*: the strength of the links in Chain A varies according to a large range of factors, including the structure of the economy, the distribution of income, and the policy choices made.

Chain B: from HD to EG

Turning to Chain B, from HD to EG, higher levels of HD, in addition to being an end in themselves, affect the economy through enhancing people's capacities and consequently their creativity and productivity. Ample evidence suggests that as people become healthier, better nourished and educated they contribute more to economic growth, through higher labour productivity, improved technology, attracting more foreign capital and higher exports.⁹

Numerous studies indicate that increases in earnings are associated with additional years of education, with the rate of return varying with the level of education.¹⁰ Analysis of the clothing and engineering industries in Sri Lanka showed that the skill and

7. See e.g. Rosenzweig and Schultz, 1981; Wolfe and Behrman, 1987; Barrera, 1991.

8. Lavy *et al.*, 1995.

9. This does not detract from the intrinsic value of improving the lives of those who cannot find employment because of disabilities or age, for example.

10. See surveys in Behrman, 1990a,b,c, 1995a; Behrman and Deolalikar, 1988, King and Hill, 1993; Psacharopoulos, 1994; Schultz, 1988, 1993a,b; Strauss and Thomas, 1995.

education levels of workers and entrepreneurs were positively related to the rate of technical change in the firm.¹¹ Moreover, in agriculture, evidence suggests positive effects of education on productivity among farmers using modern technologies.¹² In Thailand, farmers with four or more years of schooling were three times more likely to adopt fertilizer and other modern inputs than less educated farmers.¹³

These effects are embodied in growth theories. The Solow model views human capital as an important input, while the 'new growth theories' endogenise technical progress, incorporating education as well as research and development (R&D.). According to Lucas (1988), for example, the higher the level of education of the workforce the higher the overall productivity of capital because the more educated are more likely to innovate, and thus affect everyone's productivity. A complementary view is that technical progress depends on the level of R&D in the economy. Again, education plays a key role, both in contributing to R&D and via interactive learning.¹⁴

There is also a positive feedback from improved education to greater income equality. As education becomes more broadly based, low income people are better able to seek out economic opportunities which improves income distribution over time. For example, a study of the relation between schooling, income inequality and poverty in 18 countries of Latin America in the 1980s concluded that 'clearly education is the variable with the strongest impact on income equality'.¹⁵ Improved income distribution, in turn,

11. Deraniyagala, 1995.

12. Schultz, 1975; Welch, 1970; Rosenzweig, 1995; Foster and Rosenzweig, 1994; Behrman *et al.*, 1995.

13. Birdsall, 1993.

14. See Roemer, 1990; Grossman and Helpman, 1991.

15. Psacharopoulos *et al.*, 1992, p. 48. De Gregorio and Lee, 1999, find that 'higher attainment and more equal distribution of education - play a significant role in making income distribution more equal' (Abstract).

has been found to be positively associated with EG¹⁶, although the empirical basis for this appears rather fragile¹⁷.

Improved health and nutrition have also been shown to have direct effects on labour productivity, especially among poorer individuals.¹⁸ For example, calorie increases have been widely shown to raise productivity, including among farmers in Sierra Leone, sugar cane workers in Guatemala, and road construction workers in Kenya.¹⁹ A longitudinal study of a sample of children in Chile concluded that providing nutritional supplements to children to prevent malnutrition would generate benefits six to eight times the cost of the intervention in terms of additional productivity.²⁰ At the aggregate level also, health has been shown to be an important input into EG.²¹

Education and health alone, of course, cannot transform an economy. The quantity and quality of investment, domestic and foreign, together with the overall policy environment, form other important determinants of economic performance. Yet the level of human development has a bearing on these factors too.

As in Chain A, the strength of the various links in Chain B varies considerably and there is no *automatic* connection between an improved level of HD and increases in per capita GNP. It is not enough to create a larger pool of educated people; there must also exist opportunities for them to be productively employed or this might simply increase the number of educated unemployed. Other factors which affect the rate of growth, and consequently the strength of this chain, are the level of investment (supported by both domestic and foreign savings) and the overall policy setting. Higher levels of HD are also relevant here – by attracting more foreign direct investment, inducing more exports and also contributing to improvements in technology and policy.

16. Alesina and Rodrik, 1994; Alesina and Perotti, 1994; Persson and Tabellini, 1994; Birdsall *et al.*, 1995.

17 The growth/inequality nexus has been challenged by Liu, Squire and Zou (1998) who find a negative relation, while Barro (1999) and Deininger and Olinto (2000) argue that the relationship is non-linear and a positive relationship only holds for poor countries.

18. See surveys in Behrman, 1993, 1996.

19. See Cornia and Stewart, 1995; Strauss, 1986; Immink and Viteri, 1981; Wolgemuth *et al.*, 1982.

20. Selowsky and Taylor, 1973.

21 Bloom *et al.*, 2004.

III. Empirical Findings on the Links in the Chains

In previous work, we have explored some of the relationships in the two chains empirically, using data from 69 developing countries, applying OLS methods, though for some variables we have a smaller number of observations because of lack of data.²²

Because of the two way causation, we used lags of the original variables to reduce the simultaneity bias.²³

For Chain A (see Table 1) the variable chosen to measure human development progress was Infant Mortality Shortfall Reduction²⁴ (IMSR), 1960-2001. This was selected because the infant mortality rate is relatively accurate in measuring changes over time and is also correlated with other indicators, such as adult literacy and life expectancy. GDP per capita growth showed a significant positive relationship to IMSR, with higher growth of per capita income leading to better HD performance. We also found HD progress was significantly negatively associated with poverty levels and a measure of income inequality (the Gini coefficient), as well as positively with public expenditure on both health and education as a percent of GNP. It was also positively related to gross female primary enrolment, showing the importance of female literacy in the HDIF. We did not have data to investigate the impact of the female contribution to household income.

For Chain B (see Table 2), the variable chosen to measure EG was GDP per capita growth, 1960-2001. We found that EG was significantly associated with various measures of HD, including the level of literacy and the level of life expectancy. We also found that EG was significantly associated with gross domestic investment as a percent of GDP. We found evidence of income convergence but did not find that income distribution had a significant impact .

In short, these findings confirmed the importance of the two-way connection between HD and EG, and of many of the links in the two chains considered above. They

22 For the detailed regressions see Boozer et al., 2004.

23 Lagged values are reasonable candidates as instruments since the correlation between the residuals in the two periods analyzed is not substantial.

24 Shortfall reduction is measured relative to ceiling levels of countries at current maximum achievement,

also indicate that one can achieve good results in a variety of ways, by relying on the strength of particular links in the chains. For example, a country can achieve good HD progress by high growth in the face of only moderately good income distribution, so long as social expenditure ratios are high, as was the case in Malaysia. Other countries have attained good HD progress with poor growth and poor distribution, but with high social expenditure and high female enrolment rates (e.g. Jamaica). In fact research on individual countries shows that every country that was successful on HD had high female/male enrolment ratios, and relatively high social allocation ratios.

IV. Virtuous and Vicious Cycles and Lop-sided Development

The existence of two chains linking HD and EG is thus strongly supported both by our framework, drawing on micro and macro studies in the literature, and our own empirical results. This means that an economy may be on a mutually reinforcing upward spiral, with high levels of HD leading to high EG and high EG in turn further promoting HD. Conversely, weak HD may result in low EG and consequently poor progress towards HD improvement. The strength of the links in the two chains influences the extent of mutual reinforcement between HD and EG in either direction, i.e. positively or negatively.

Consequently, country performance can be usefully classified into four categories, *virtuous*, *vicious* and two types of *lopsidedness*, i.e. lopsided with relatively strong HD/weak EG (called 'HD-lopsided'); and lopsided with relatively weak HD/strong EG ('EG-lopsided'). In the virtuous cycle case, good HD enhances EG, which, in turn, promotes HD, and so on. In the vicious cycle case, poor performance on HD tends to lead to poor EG performance which in turn depresses HD achievements, and so on. The stronger the linkages in the two chains described above the more pronounced the cycle of EG and HD, either in a positive or negative direction.

Where some linkages are weak, cases of lopsided development may occur. On the one hand, good EG may not bring about large improvements in HD if, for example, there are weak linkages such as a low social allocation ratio; on the other hand, good HD performance may not generate good EG if there is a dearth of complementary resources because of low investment rates. Such cases of lopsided development are unlikely to

i.e. 3/1000 for infant mortality; and 85 years of age for life expectancy.

persist. Either the weak partner in the cycle eventually acts as a brake on the other partner, leading to a vicious cycle case, or, if the linkages are strengthened, possibly by policy change, a virtuous cycle may result.

One way of classifying countries into the four categories is to compare their performance on HD and EG (1960-2001) with the average performance of all developing countries (see Figure 2). The vertical and horizontal grid lines represent the average performance for all developing countries for the period, with countries weighted by their populations in 2001. Most developing countries appear as either virtuous (NE quadrant), or vicious (SW quadrant); a significant number show an HD-lopsided pattern, and only one an EG-lopsided one. A strong regional pattern emerges, with East Asia heavily represented in the virtuous cycle quadrant. The majority of countries in the vicious cycle quadrant are from Sub-Saharan Africa, with a significant number from Latin America. Latin America is also strongly represented in the HD-lopsided quadrant, with the one EG-lopsided country from Africa.

The important issue for policy purposes, of course, is how a country may move towards the virtuous cycle. Much can be learned about this by looking at the ways in which countries changed their location over time (Table 3). Examining the movements of countries over the four decades between 1960 and 2001, we find that only five countries succeeded in moving from the HD-lopsided to the virtuous category, while three remained in the virtuous category throughout. The others in that quadrant moved in and out of the HD-lopsided category, often in response to particular short-term economic difficulties, such as the 1980s debt crisis which affected many of the Latin American countries and the 1997 East Asian financial crisis. There was a strong tendency for countries in the vicious cycle to remain there; only five exited, four into HD-lopsided, and one into EG-lopsided. Lop-sidedness, as expected, proved generally unstable. As noted, some countries succeeded in moving from the HD-lopsided category into the virtuous category. No country remained in the EG-lopsided category. Almost invariably, EG-lopsided countries fell into the vicious category and no country succeeded in moving from EG-lopsided to virtuous. These findings clearly have some strong implications for policy sequencing. They imply that it is not possible to reach the ideal of a virtuous cycle

by first generating improved EG while neglecting HD since any EG attained in this way will not be sustained.

V. Conclusions and Policy Implications.

Our investigation into the determinants of HD progress and EG has clearly demonstrated the importance of the two-way relationship between them. The empirical work confirmed the significance of a number of links in the two chains – including income distribution, the social expenditure ratio and female education in Chain A, and the investment ratio in Chain B, in addition to the important inputs of EG and HD, respectively. Moreover, we have found that even in the presence of some weak links in a chain, it is possible to achieve good progress by particularly strong performance in other links.

However, our most important conclusion concerns sequencing. Because of the strong two-way relationship between EG and HD one has to promote *both* to sustain progress in either. Economic growth, which is an important input into HD improvement, is itself not sustainable without improvement in HD. The investigation of country changes over time have strong implications for the phasing of policies. Economic policy has tended to focus priority on getting the economic fundamentals 'right' as a necessary precondition for economic growth, arguing that HD improvement must await such economic growth – for example, in the classic 'Washington consensus'. In sharp contrast, our findings contradict the view that HD improvement may be postponed until economic resource expansion makes it affordable. If HD improvement is postponed in this way, EG itself will not be sustained.

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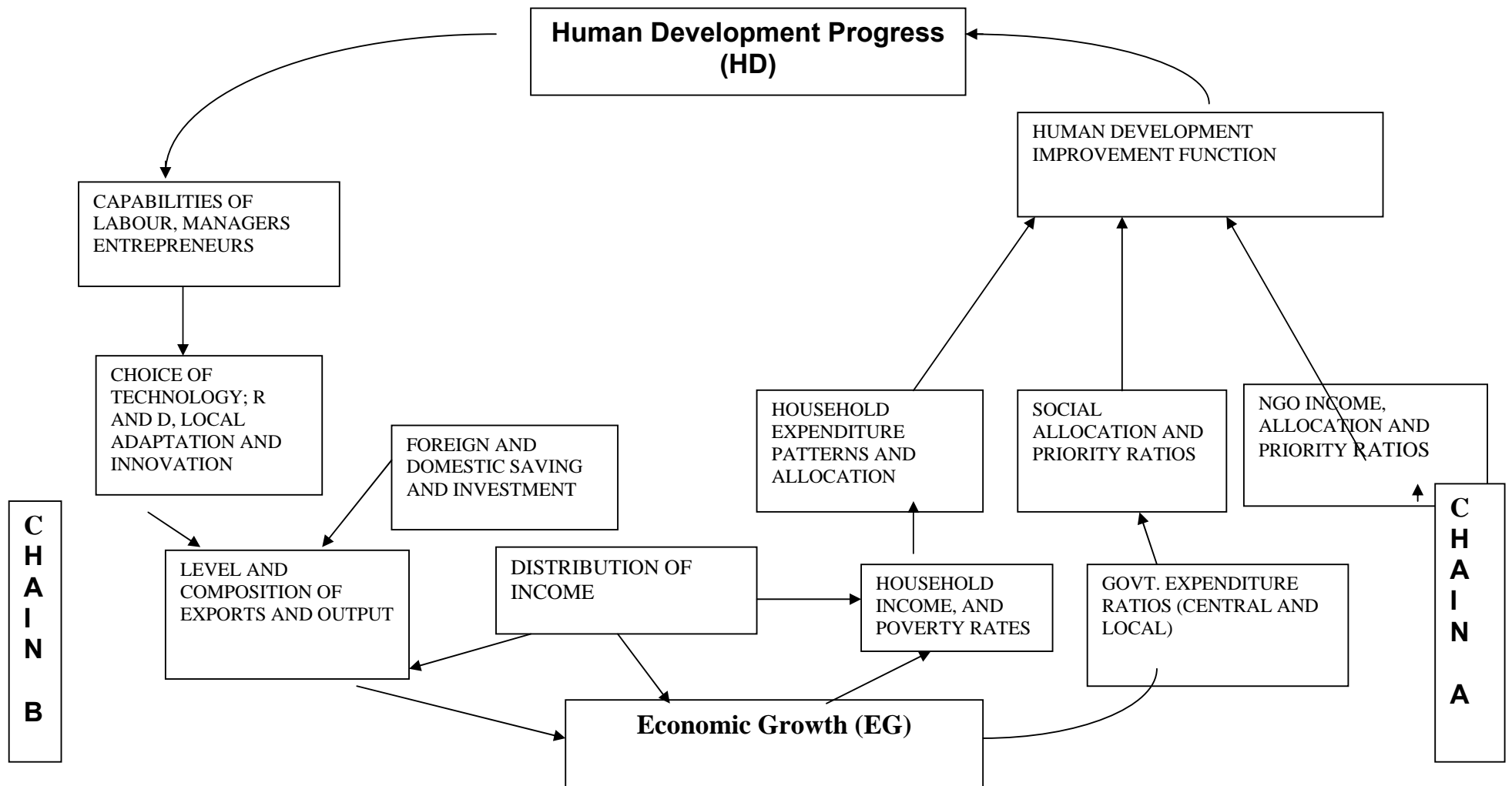


Figure 1

Figure 2
HD and EG Performance, 1960-2001

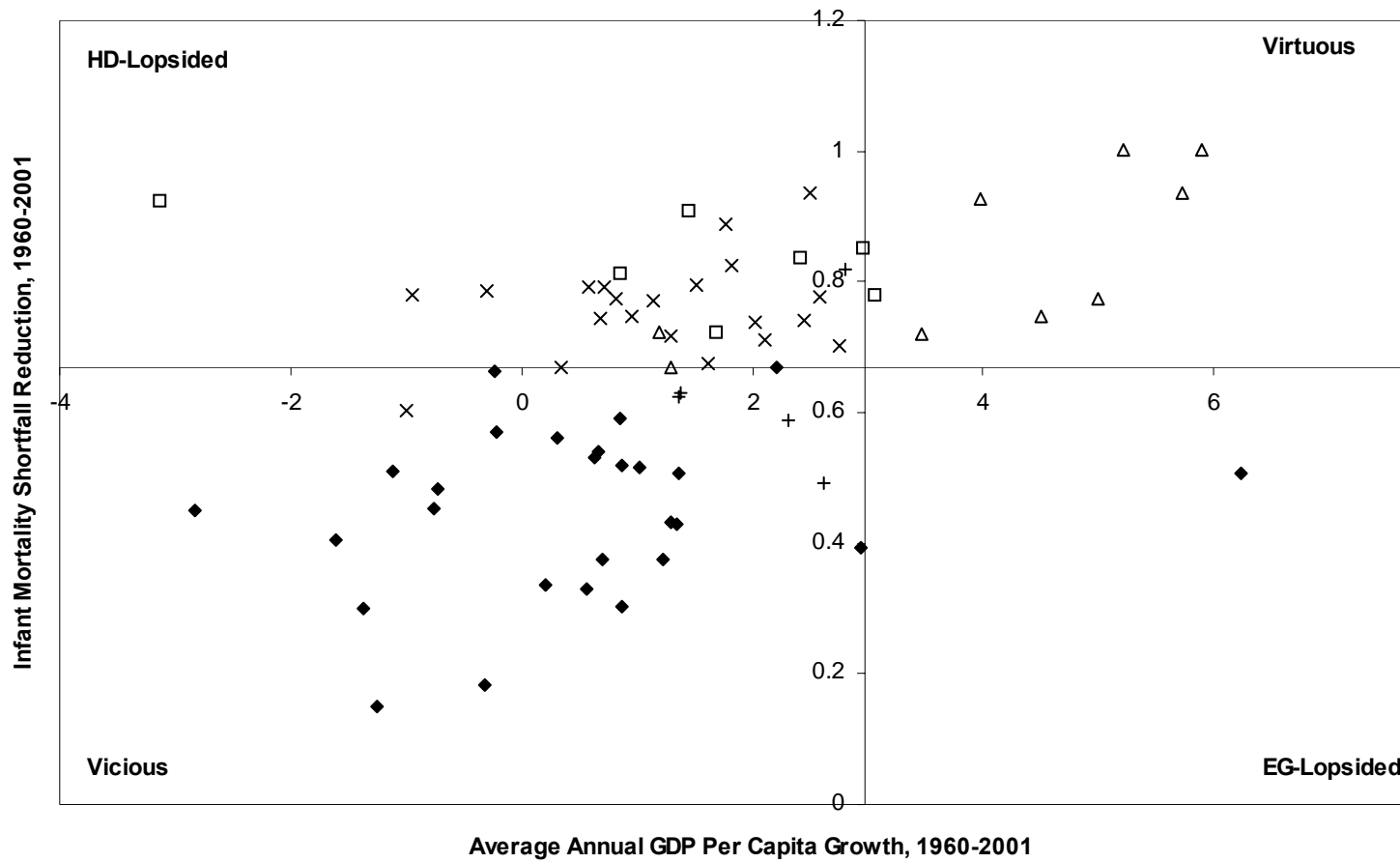


Table 1
Chain A Regressions: From EG to the Change in HD
(Measure of Δ HD is IMSR, 1960-2001)

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GDP per Capita, 1960 x10 ⁶	4.84 (1.45)	4.60 (1.33)	4.63 (1.33)	30.8 (1.21)	22.8 (1.21)	3.65 (1.14)	-7.13 (0.32)	-4.61 (0.21)
GDP per Capita Growth Rate, 1960- 1980 x 10	1.06** (2.07)	0.99* (1.85)	1.01* (1.85)	1.30 (1.64)	0.59 (0.94)	1.09* (1.97)	-1.31 (1.58)	-1.22 (1.50)
Gross Primary Enrollment Rate, 1960 x 1000	1.08* (1.77)	-	0.60 (0.29)	-	-	-	-	0.86 (1.06)
Gross Female Primary Enrollment Rate, 1960 x 1000	-	1.04* (1.73)	0.50 (0.26)	2.76*** (3.14)	1.07 (1.46)	2.21*** (3.24)	0.96 (1.31)	-
Gini Coefficient, average over 1960- 2001 x 1000	-	-	-	-4.89* (1.83)	0.20 (0.09)	-	-	-
Poverty Headcount, average over 1985-2001 x 1000	-	-	-	-	-	-	-3.83*** (2.93)	-3.73*** (2.85)
Public Expenditure on Education (% of GDP), 1980-1990 x 100	-	-	-	-	-	1.21*** (2.80)	-	-
Public Expenditure on Health (% of GNP), 1960 x 100	-	-	-	-	-	6.13** (2.65)	-	-
Middle East Dummy	0.32*** (6.02)	0.33*** (6.08)	0.33*** (5.70)	-	0.34*** (4.96)	0.41*** (7.53)	0.28*** (4.21)	0.28*** (4.20)
Asia Dummy	0.25*** (6.01)	0.25*** (6.12)	0.25*** (5.84)	-	0.28*** (5.64)	0.34*** (7.30)	0.19*** (3.98)	0.19*** (3.93)

Latin America Dummy	0.24*** (6.10)	0.24*** (5.65)	0.24*** (5.60)	-	0.25*** (5.15)	0.31*** (6.86)	0.26*** (5.02)	0.27*** (5.29)
Intercept	0.35*** (10.62)	0.36*** (12.84)	0.35*** (8.47)	0.61*** (5.07)	0.33*** (3.19)	0.10 (1.56)	0.58*** (7.20)	0.57*** (6.52)
Number of Observations	67	66	66	55	55	43	49	50
R-squared	0.72	0.72	0.72	0.44	0.73	0.83	0.74	0.74

Notes: Figures in parentheses are absolute t-statistics. Omitted region is Africa.

* indicates significance at the 10% level, ** at the 5% level and *** at the 1% level.

Note that the Gross Female Primary Enrollment Rate and Ratio of Female to Male Primary Enrollment Rate are highly correlated (0.76).

Table 2
Chain B Regressions: From HD to EG
(Measure of EG is GDP per Capita Growth, 1960-2001)

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Log GDP per Capita, 1960 x 10	-2.80*** (3.42)	-2.64*** (3.04)	-3.32*** (3.80)	-1.54 (1.62)	-2.33** (2.38)	-2.86*** (3.43)	-2.91*** (3.66)	-2.63*** (3.27)	-2.96*** (3.81)
Literacy Rate, 1970-1975 x100	1.95*** (4.88)	-	1.29** (2.25)	0.98** (2.12)	-	-	0.95 (1.61)	-	-
Literacy Shortfall Reduction, 1970-1980	-	-	-	-	-	-	4.97** (2.22)	4.21*** (2.74)	1.94 (1.53)
Log Life Expectancy, 1960	-	2.67*** (4.31)	1.43 (1.59)	-	1.81*** (2.93)	2.27*** (3.71)	-	-	-
Life Expectancy Shortfall Reduction, 1960-1980	-	-	-	-	-	2.21*** (2.71)	-	-	-
Gross Domestic Investment (% of GDP), average over 1960-2001 x 100	-	-	-	5.81*** (3.71)	5.57*** (4.36)	-	-	5.04*** (3.60)	2.80** (2.39)
Exports (% of GDP), average over 1960-2001 x 1000	-	-	-	-	-	-	-	3.76 (1.14)	1.80 (0.42)
Gini coefficient, average over 1960-2001 x 1000	-	-	-	-1.61 (0.18)	3.46 (0.41)	-	-	-	-
Poverty Headcount, average over 1985-2001 x 1000	-	-	-	-	-	-	-	-	-16.4*** (4.94)
Middle East Dummy	0.65*** (2.64)	0.17 (0.68)	0.48* (1.84)	0.25 (0.80)	0.05 (0.19)	-0.06 (0.25)	0.57** (2.40)	0.29 (1.30)	0.21 (1.00)

Asia Dummy	0.66*** (3.41)	0.63*** (3.06)	0.59*** (2.95)	0.46** (2.25)	0.45** (2.33)	0.40* (1.86)	0.63*** (3.36)	0.56*** (3.37)	0.42*** (3.14)
Latin America Dummy	-0.12 (0.61)	-0.21 (0.94)	-0.22 (1.02)	-0.13 (0.62)	-0.15 (0.77)	-0.30 (1.43)	0.03 (0.13)	0.28 (1.62)	0.36** (2.40)
Intercept	1.19*** (2.71)	-8.18*** (4.01)	-3.62 (1.18)	-0.14 (0.23)	-6.28*** (3.07)	-6.89*** (3.44)	1.19*** (2.80)	0.40 (0.80)	1.89*** (3.77)
Number of Observations	67	69	67	55	57	69	67	67	50
R-squared	0.52	0.48	0.54	0.64	0.67	0.54	0.56	0.66	0.79

Notes: Figures in parentheses are absolute t-statistics. For region, the base group is Africa.

* indicates significance at the 10% level, ** at the 5% level and *** at the 1% level.

Note that the Log of Life Expectancy and the Poverty Headcount are highly correlated (-0.59) and that the Poverty Headcount and the Gross Female Primary Enrollment Rate are correlated (-0.51). Also, the Literacy Rate and the Literacy SR are highly correlated (0.83). All data from the online WDI (2003) except public expenditure on health (from HDR 2001).

Table 3
Virtuous, Vicious and Lop-Sided Performance, 1960-2001

	1960-1970	1970-1980	1980-1990	1990-2001
Africa				
Benin	Vicious	Vicious	Vicious	Vicious
Botswana	Virtuous	Virtuous	Virtuous	HD-Lopsided
Burkina Faso	Vicious	Vicious	Vicious	Vicious
Burundi	EG-Lopsided	Vicious	Vicious	Vicious
Cameroon	Vicious	EG-Lopsided	Vicious	Vicious
Central African Republic	Vicious	Vicious	Vicious	Vicious
Chad	Vicious	Vicious	Vicious	Vicious
Congo, Dem. Rep.	Vicious	Vicious	Vicious	Vicious
Congo, Rep.	Virtuous	Virtuous	Vicious	Vicious
Cote d'Ivoire	EG-Lopsided	Vicious	Vicious	Vicious
Ethiopia	-	-	Vicious	Vicious
Gabon	EG-Lopsided	EG-Lopsided	Vicious	Vicious
Gambia, The	-	Vicious	Vicious	Vicious
Ghana	HD-Lopsided	Vicious	Vicious	Vicious
Guinea-Bissau	-	Vicious	Vicious	Vicious
Kenya	HD-Lopsided	Virtuous	HD-Lopsided	HD-Lopsided
Lesotho	EG-Lopsided	EG-Lopsided	Vicious	Vicious
Madagascar	Vicious	Vicious	Vicious	Vicious
Malawi	EG-Lopsided	EG-Lopsided	Vicious	Vicious
Mali	-	Vicious	Vicious	Vicious
Mauritania	EG-Lopsided	Vicious	Vicious	Vicious
Mauritius	-	-	Virtuous	HD-Lopsided
Mozambique	-	-	Vicious	EG-Lopsided
Namibia	-	-	Vicious	Vicious
Niger	Vicious	Vicious	Vicious	Vicious
Nigeria	EG-Lopsided	Vicious	Vicious	Vicious
Rwanda	Vicious	Vicious	Vicious	Vicious
Senegal	Vicious	Vicious	Vicious	Vicious
Sierra Leone	EG-Lopsided	Vicious	Vicious	Vicious
South Africa	Virtuous	HD-Lopsided	HD-Lopsided	HD-Lopsided
Sudan	Vicious	Vicious	Vicious	EG-Lopsided
Togo	EG-Lopsided	Vicious	Vicious	Vicious
Zambia	HD-Lopsided	Vicious	Vicious	Vicious
Zimbabwe	Virtuous	HD-Lopsided	HD-Lopsided	HD-Lopsided

Middle East

Algeria	Vicious	EG-Lopsided	Vicious	HD-Lopsided
Egypt, Arab Rep.	EG-Lopsided	EG-Lopsided	Vicious	Vicious
Iran, Islamic Rep.	-	Vicious	Vicious	HD-Lopsided
Jordan	-	-	HD-Lopsided	HD-Lopsided
Kuwait	HD-Lopsided	HD-Lopsided	HD-Lopsided	HD-Lopsided
Morocco	EG-Lopsided	EG-Lopsided	Vicious	Vicious
Oman	EG-Lopsided	Vicious	Virtuous	-
Saudi Arabia	EG-Lopsided	EG-Lopsided	HD-Lopsided	HD-Lopsided
Syrian Arab Republic	Virtuous	Virtuous	HD-Lopsided	HD-Lopsided
Tunisia	EG-Lopsided	EG-Lopsided	HD-Lopsided	HD-Lopsided
Turkey	-	Vicious	Vicious	HD-Lopsided
United Arab Emirates	-	HD-Lopsided	HD-Lopsided	HD-Lopsided

East Asia

China	HD-Lopsided	Virtuous	Virtuous	Virtuous
Hong Kong, China	Virtuous	Virtuous	Virtuous	HD-Lopsided
Indonesia	Virtuous	EG-Lopsided	EG-Lopsided	HD-Lopsided
Korea, Rep.	Virtuous	Virtuous	Virtuous	Virtuous
Lao PDR	-	-	Vicious	Vicious
Malaysia	Virtuous	Virtuous	HD-Lopsided	Virtuous
Mongolia	-	-	Vicious	Vicious
Papua New Guinea	EG-Lopsided	Vicious	HD-Lopsided	Vicious
Philippines	Virtuous	Virtuous	HD-Lopsided	HD-Lopsided
Singapore	Virtuous	Virtuous	Virtuous	Virtuous
Thailand	Virtuous	Virtuous	Virtuous	HD-Lopsided
Vietnam	-	-	HD-Lopsided	Virtuous

Latin America

Argentina	Virtuous	HD-Lopsided	HD-Lopsided	HD-Lopsided
Bolivia	Vicious	Vicious	Vicious	Vicious
Brazil	Virtuous	Virtuous	HD-Lopsided	HD-Lopsided
Chile	Virtuous	HD-Lopsided	HD-Lopsided	Virtuous
Colombia	Virtuous	Virtuous	HD-Lopsided	HD-Lopsided
Costa Rica	Virtuous	Virtuous	HD-Lopsided	HD-Lopsided
Dominican Republic	Virtuous	Virtuous	HD-Lopsided	Virtuous
Ecuador	HD-Lopsided	Virtuous	HD-Lopsided	HD-Lopsided
El Salvador	Virtuous	Vicious	Vicious	HD-Lopsided
Guatemala	Virtuous	EG-Lopsided	Vicious	HD-Lopsided
Haiti	Vicious	EG-Lopsided	Vicious	Vicious
Honduras	Vicious	Vicious	HD-Lopsided	HD-Lopsided
Jamaica	Virtuous	HD-Lopsided	HD-Lopsided	HD-Lopsided
Mexico	Virtuous	Virtuous	HD-Lopsided	HD-Lopsided
Nicaragua	Virtuous	HD-Lopsided	Vicious	HD-Lopsided

Panama	Virtuous	HD-Lopsided	HD-Lopsided	HD-Lopsided
Paraguay	Virtuous	Virtuous	HD-Lopsided	HD-Lopsided
Peru	Virtuous	Vicious	HD-Lopsided	HD-Lopsided
Trinidad and Tobago	Virtuous	Virtuous	HD-Lopsided	HD-Lopsided
Uruguay	HD-Lopsided	Virtuous	HD-Lopsided	HD-Lopsided
Venezuela, RB	HD-Lopsided	HD-Lopsided	HD-Lopsided	HD-Lopsided
South Asia				
Bangladesh	Vicious	Vicious	Vicious	Vicious
India	Vicious	Vicious	EG-Lopsided	Vicious
Nepal	Vicious	Vicious	Vicious	Vicious
Pakistan	EG-Lopsided	Vicious	Vicious	Vicious
Sri Lanka	Virtuous	Virtuous	HD-Lopsided	HD-Lopsided

Notes: Data source is the online World Development Indicators (2003).
All classifications of countries into quadrants are based on performance relative to
population weighted developing world averages.